

WHAT IS CLAIMED IS:

1. An optical hybrid module comprising:

a substrate;

an optical waveguide formed on at least a portion of the substrate to perform a
5 transmission of optical signals, said waveguide being adapted for connection with a
plurality of optical devices; and

a light blocking layer formed to have an inclined profile at opposite sides of an
end surface of an optical coupling portion centrally provided in the optical waveguide,
said light blocking layer preventing light from entering the optical devices when
10 coupled to the optical waveguide through regions other than the optical waveguide.

2. The optical hybrid module as set forth in claim 1, further comprising a
plurality of optical devices mounted on the substrate that are optically coupled with the
optical waveguide.

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3. The optical hybrid module as set forth in claim 1, wherein the plurality of
optical devices mounted on the substrate includes a light receiving device optically
coupled with the waveguide.

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4. The optical hybrid module as set forth in claim 3, wherein the plurality of optical devices mounted on the substrate includes:

a multi-layer thin film filter arranged at least partly within and substantially perpendicular to the optical waveguide so as to reflect light of a predetermined wavelength transmitted through the optical waveguide, and permit passage of light having a different wavelength from the predetermined wavelength, and

an optical fiber; and

a separate light source, such that the light from the optical fiber and from the separate light source enter the waveguide from separate paths; and

wherein light entering the optical fiber from a first path and exiting the separate light source from a second path travel through the waveguide and are incident upon the a multi-layer thin film filter.

5. The optical hybrid module as set forth in claim 1, wherein the plurality of optical devices are integrally formed on the substrate module.

6. The optical hybrid module as set forth in claim 1, wherein an end surface of the optical coupling portion centrally provided in the optical waveguide is recessed relative to the light blocking layer by having a groove.

7. The optical hybrid module as set forth in claim 1, wherein an end surface of the optical coupling portion centrally provided in the optical waveguide is protruded relative to the light blocking layer.

8. The optical hybrid module as set forth in claim 1, wherein the waveguide comprises an end surface of the optical coupling portion centrally provided that is formed substantially perpendicular to an upper surface of the substrate.

9. The optical hybrid module as set forth in claim 8, wherein the perpendicular end surface of the optical coupling portion is recessed relative to a position of the inclined surfaces of the light blocking layer.

10. The optical hybrid module as set forth in claim 1, wherein the light blocking layer is formed over a surface of the optical waveguide, except for the optical coupling portion, and over a whole surface of the substrate.

5 11. The optical hybrid module as set forth in claim 1, wherein the light blocking layer comprises a metal layer.

12. The optical hybrid module as set forth in claim 1, wherein the light blocking layer comprises a mirror material.

13. The optical hybrid module as set forth in claim 1, wherein an end surface of the optical coupling portion centrally provided in the optical waveguide is recessed relative to the inclined surfaces of the light blocking layer.

14. The optical hybrid module as set forth in claim 1, wherein the optical waveguide comprises:

- a core layer; and
- a cladding layer surrounding the core layer.

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15. The optical hybrid module as set forth in claim 1, wherein the light blocking layer is formed on a whole upper surface of the optical waveguide.

16. A manufacturing method of an optical hybrid module comprising the steps
10 of:

- (a) forming an optical waveguide on a substrate;
- (b) patterning a hard etching mask for forming a vertical end surface on a region of the optical waveguide including an optical coupling portion;
- (c) patterning inclined masks for forming inclined end surfaces on regions not
15 formed with the hard etching mask at opposite sides of the region including the optical coupling portion;
- (d) etching the optical waveguide under the hard etching mask and inclined masks; and
- (e) forming a light blocking layer on the inclined end surfaces of the optical
20 waveguide, except for the vertical end surface of the region including at least the optical coupling portion, and on the substrate.

17. The manufacturing method of the optical hybrid module as set forth in claim 16, wherein the step (c) is performed by a grayscale lithography process.

18. The manufacturing method of the optical hybrid module as set forth in claim 16, wherein step (e) is performed by a metal deposition process.

5 19. The manufacturing method of the optical hybrid module as set forth in claim 16, wherein the light blocking layer is formed over a whole surface of the optical waveguide, except for the optical coupling portion, and over a whole surface of the substrate.

10 20. The manufacturing method of the optical hybrid module as set forth in claim 16, wherein step (e) is performed by arranging a mirrored material on the inclined end surfaces.

21. The manufacturing method of the optical hybrid module as set forth in
15 claim 16, further comprising:

(f) integrally forming a plurality of optical devices on the substrate.

22. The manufacturing method of the optical hybrid module as set forth
in claim 21, further comprising:

20 (g) optically coupling the plurality of optical devices formed on the substrate in step (f) with the optical waveguide.

23. The manufacturing method of the optical hybrid module as set forth
in claim 21, wherein the plurality of optical devices includes a multi-layer thin film
filter arranged at least partly within said waveguide and being arranged substantially
5 perpendicular to said waveguide to as to provide a filter in a path of the waveguide.

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